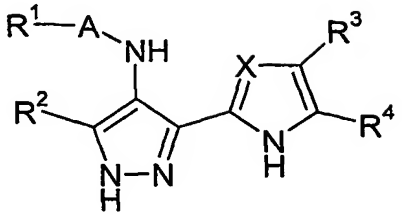
## CLAIMS

1. A compound of the formula (I):



or a salt, N-oxide or solvate thereof;

wherein

X is $CR^5$ or N;

A is a bond or $-(CH_2)_m-(B)_n-$;

B is C=O, $NR^g(C=O)$ or O(C=O) wherein $R^g$ is hydrogen or $C_{1-4}$ hydrocarbyl optionally substituted by hydroxy or $C_{1-4}$ alkoxy;

m is 0, 1 or 2;

n is 0 or 1;

$R^1$ is hydrogen, a carbocyclic or heterocyclic group having from 3 to 12 ring members, or an optionally substituted $C_{1-8}$ hydrocarbyl group;

$R^2$ is hydrogen, halogen, methoxy, or a $C_{1-4}$ hydrocarbyl group optionally substituted by halogen, hydroxyl or methoxy;

$R^3$ and $R^4$ are the same or different and each is selected from hydrogen, CN, $C(O)R^8$, optionally substituted $C_{1-8}$ hydrocarbyl and carbocyclic or heterocyclic groups having from 3 to 12 ring members; and

$R^5$ is hydrogen, a group $R^2$ or a group $R^{10}$ wherein $R^{10}$ is selected from halogen, hydroxy, trifluoromethyl, cyano, nitro, carboxy, amino, mono- or di-$C_{1-4}$ hydrocarbylamino, carbocyclic and heterocyclic groups having from 3 to 12 ring members; a group $R^a$-$R^b$ wherein $R^a$ is a bond, O, CO, $X^1C(X^2)$, $C(X^2)X^1$, $X^1C(X^2)X^1$, S, SO, $SO_2$, $NR^c$, $SO_2NR^c$ or $NR^cSO_2$; and $R^b$ is selected from hydrogen, carbocyclic and heterocyclic groups having from 3 to 12 ring members, and a $C_{1-8}$ hydrocarbyl group optionally substituted by one or more substituents selected from hydroxy, oxo,

halogen, cyano, nitro, carboxy, amino, mono- or di-$C_{1-4}$ hydrocarbylamino, carbocyclic and heterocyclic groups having from 3 to 12 ring members and wherein one or more carbon atoms of the $C_{1-8}$ hydrocarbyl group may optionally be replaced by O, S, SO, $SO_2$, $NR^c$, $X^1C(X^2)$, $C(X^2)X^1$ or $X^1C(X^2)X^1$;

$R^c$ is selected from hydrogen and $C_{1-4}$ hydrocarbyl;

$X^1$ is O, S or $NR^c$ and $X^2$ is =O, =S or $=NR^c$; and

$R^8$ is selected from $OR^{11}$, $SR^{11}$ and $NR^{12}R^{13}$;

$R^{11}$ is selected from optionally substituted $C_{1-8}$ hydrocarbyl and carbocyclic or heterocyclic groups having from 3 to 12 ring members; and

one of $R^{12}$ and $R^{13}$ is a group $R^{11}$ and the other of $R^{12}$ and $R^{13}$ is hydrogen or $C_{1-4}$ alkyl; or $R^{12}$ and $R^{13}$ and the nitrogen atom to which they are attached together form a saturated heterocyclic group having from 4 to 7 ring members and containing 1, 2 or 3 heteroatom ring members selected from N, O and S.

2. A compound according to claim 1 wherein $R^3$ and $R^4$ are the same or different and each is selected from hydrogen, optionally substituted $C_{1-8}$ hydrocarbyl and carbocyclic or heterocyclic groups having from 3 to 12 ring members.

3. A compound according to claim 1 or claim 2 wherein X is N.

4. A compound according to any one of the preceding claims wherein m is 0 or 1, n is 1 and B is C=O.

5. A compound according to any one of the preceding claims wherein $R^2$ is hydrogen, fluorine or methyl.

6. A compound according to claim 5 wherein $R^2$ is hydrogen.

7. A compound according to any one of the preceding claims wherein $R^1$ is a carbocyclic or heterocyclic group having from 3 to 12 ring members.

8. A compound according to claim 7 wherein the carbocyclic or heterocyclic group is (i) monocyclic or (ii) bicyclic.

9. A compound according to claim 6 or claim 7 wherein the carbocyclic or heterocyclic group is an aryl or heteroaryl group.

10. A compound according to claim 9 wherein the aryl or heteroaryl group is selected from phenyl, pyrazolo[1,5-a]pyridinyl (e.g. pyrazolo[1,5-a]pyridin-3-yl), furanyl (e.g. 2-furanyl and 3-furanyl), indolyl (e.g. 3-indolyl, 4-indolyl and 7-indolyl), oxazolyl, thiazolyl (e.g. thiazol-2-yl and thiazol-5-yl), isoxazolyl (e.g. isoxazol-3-yl and isoxazol-4-yl), pyrrolyl (e.g. 3-pyrrolyl), pyridyl (e.g. 2-pyridyl), quinolinyl (e.g. quinolin-8-yl), 2,3-dihydro-benzo[1,4]dioxine (e.g. 2,3-dihydro-benzo[1,4]dioxin-5-yl), benzo[1,3]dioxole (e.g. benzo[1,3]dioxol-4-yl), 2,3-dihydrobenzofuranyl (e.g. 2,3-dihydrobenzofuran-7-yl), imidazolyl and thienyl (e.g. 3-thienyl).

11. A compound according to claim 10 wherein the aryl or heteroaryl group is selected from pyrazolo[1,5-a]pyridinyl, furanyl, 2,3-dihydrobenzofuranyl, thienyl, indolyl, thiazolyl, isoxazolyl and 2,3-dihydro-benzo[1,4]dioxine groups

12. A compound according to claim 9 wherein the aryl or heteroaryl group is selected from phenyl, furanyl, indolyl, oxazolyl, isoxazolyl, pyridyl, quinolinyl, 2,3-dihydro-benzo[1,4]dioxine, benzo[1,3]dioxole, imidazolyl and thienyl.

13. A compound according to any one of the preceding claims wherein $R^1$ is a carbocyclic or heterocyclic group unsubstituted or substituted by one or more substituent groups $R^{10}$ as defined in claim 1.

14. A compound according to claim 13 wherein $R^1$ is unsubstituted or is substituted by one or more substituent groups selected from the group $R^{10a}$ consisting of halogen, hydroxy, trifluoromethyl, cyano, nitro, carboxy, heterocyclic groups having 5 or 6 ring members and up to 2 heteroatoms

selected from O, N and S, a group $R^a$-$R^b$ wherein $R^a$ is a bond, O, CO, $X^3C(X^4)$, $C(X^4)X^3$, $X^3C(X^4)X^3$, S, SO, or $SO_2$, and $R^b$ is selected from hydrogen, heterocyclic groups having 5 or 6 ring members and up to 2 heteroatoms selected from O, N and S, and a $C_{1-8}$ hydrocarbyl group optionally substituted by one or more substituents selected from hydroxy, oxo, halogen, cyano, nitro, carboxy, amino, mono- or di-$C_{1-4}$ hydrocarbylamino, carbocyclic and heterocyclic groups having 5 or 6 ring members and up to 2 heteroatoms selected from O, N and S; wherein one or more carbon atoms of the $C_{1-8}$ hydrocarbyl group may optionally be replaced by O, S, SO, $SO_2$, $X^3C(X^4)$, $C(X^4)X^3$ or $X^3C(X^4)X^3$; $X^3$ is O or S; and $X^4$ is =O or =S.

15. A compound according to claim 14 wherein $R^1$ is unsubstituted or is substituted by one or more substituent groups selected from the group $R^{10b}$ consisting of halogen, hydroxy, trifluoromethyl, cyano, nitro, carboxy, a group $R^a$-$R^b$ wherein $R^a$ is a bond, O, CO, $X^3C(X^4)$, $C(X^4)X^3$, $X^3C(X^4)X^3$, S, SO, or $SO_2$, and $R^b$ is selected from hydrogen and a $C_{1-8}$ hydrocarbyl group optionally substituted by one or more substituents selected from hydroxy, oxo, halogen, cyano, nitro, carboxy; wherein one or more carbon atoms of the $C_{1-8}$ hydrocarbyl group may optionally be replaced by O, S, SO, $SO_2$, $X^3C(X^4)$, $C(X^4)X^3$ or $X^3C(X^4)X^3$; $X^3$ is O or S; and $X^4$ is =O or =S.

16. A compound according to claim 15 wherein $R^1$ is unsubstituted.

17. A compound according to claim 16 wherein $R^1$ is substituted and the substituents are selected from fluorine, chlorine, methoxy, methyl, oxazolyl, morpholino, trifluoromethyl, bromomethyl, chloroethyl, pyrrolidino, pyrrolidinylethoxy, pyrrolidinylmethyl, difluoromethoxy and morpholinomethyl.

18. A compound according to claim 14 wherein $R^1$ is a phenyl group having 1, 2 or 3 substituents located at any one or more of the 2-, 3-, 4- or 6-positions around the phenyl ring.

19. A compound according to claim 18 wherein the phenyl group $R^1$ is 2,6-disubstituted, 2,3-disubstituted, 2,4-disubstituted 2,5-disubstituted, 2,3,6-trisubstituted or 2,4,6-trisubstituted.

20. A compound according to claim 19 wherein the phenyl group $R^1$ is disubstituted at positions 2- and 6- with substituents selected from fluorine, chlorine and $R^a$-$R^b$, where $R^a$ is O and $R^b$ is $C_{1-4}$ alkyl.

21. A compound according to any one of the preceding claims wherein $R^1$ is a group as set out in Table 1 herein.

22. A compound according to claim 20 wherein $R^1$ is selected from groups A1 to A61 (e.g. A1 to A34) in Table 1.

23. A compound according to claim 21 wherein $R^1$ is selected from groups A1 to A8 in Table 1, i.e. 2,6-difluorophenyl, 2-chloro-6-fluorophenyl, 2-fluoro-6-methoxyphenyl, 2,6-dichlorophenyl, 2,4,6-trifluorophenyl, 2-chloro-6-methyl, 2,3-dihydro-benzo[1,4]dioxin-5-yl and pyrazolo[1,5-a]pyridin-3-yl.

24. A compound according to any one of the preceding claims wherein at least one of $R^3$ and $R^4$ is other than hydrogen.

25. A compound according to claim 24 wherein one of $R^3$ and $R^4$ is hydrogen, and the other is selected from optionally substituted $C_{1-8}$ hydrocarbyl and carbocyclic or heterocyclic groups having from 3 to 12 ring members.

26. A compound according to claim 24 or claim 25 wherein one of $R^3$ and $R^4$ is an optionally substituted group selected from $C_{1-8}$ hydrocarbyl, phenyl, naphthyl, thienyl, isoxazolyl, pyridyl, 2,3-dihydro-benzo[1,4]dioxine.

27. A compound according to claim 26 wherein one of $R^3$ and $R^4$ is an optionally substituted phenyl or pyridyl group.

28. A compound according to claim 27 wherein one of $R^3$ and $R^4$ is an unsubstituted pyridyl group.

29. A compound according to claim 27 wherein one of $R^3$ and $R^4$ is an unsubstituted phenyl group or a phenyl group substituted with up to 3 fluorine atoms.

30. A compound according to any one of claims 26 to 29 wherein each of $R^3$ and $R^4$ is an optionally substituted group selected from $C_{1-8}$ hydrocarbyl, phenyl, naphthyl, thienyl, isoxazolyl, pyridyl, 2,3-dihydro-benzo[1,4]dioxine.

31. A compound according to claim 30 wherein one of $R^3$ and $R^4$ is an optionally substituted group selected from phenyl, naphthyl, thienyl, isoxazolyl, pyridyl, 2,3-dihydro-benzo[1,4]dioxine, and the other one of $R^3$ and $R^4$ is an optionally substituted $C_{1-8}$ hydrocarbyl group.

32. A compound according to any one of claims 25 to 27, 30 and 31 wherein the optional substituents for the carbocyclic or heterocyclic groups are selected from the groups $R^{10}$, $R^{10a}$ and $R^{10b}$ as defined in any one of claims 1, 14 and 15.

33. A compound according to any one of claims 25, 26, 30 and 31 wherein the optionally substituted $C_{1-8}$ hydrocarbyl group is selected from $C_{1-4}$ alkyl, hydroxy-$C_{1-4}$ alkyl and $C_{2-4}$ alkenyl.

34. A compound according to any one of claims 1 to 23 wherein one of $R^3$ and $R^4$ is a $C_{1-8}$ hydrocarbyl group optionally substituted by a substituent selected from optionally substituted monocyclic carbocyclic and heterocyclic groups, $NR^{12}R^{13}$, $C_{1-4}$ alkoxy, halogen, hydroxy, $C_{1-4}$ alkylsulphonylamino, amino, mono- and di-$C_{1-4}$ alkylamino, wherein the

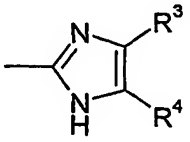
alkyl residues of the $C_{1-4}$ alkoxy, mono- and di-$C_{1-4}$ alkylamino groups may themselves be further substituted by a substituent selected from $NR^{12}R^{13}$, $C_{1-4}$ alkoxy, hydroxy, $C_{1-4}$ alkylsulphonylamino, amino, and mono- and di-$C_{1-4}$ alkylamino, wherein $R^{12}$ and $R^{13}$ are as defined in claim 1, and wherein the optional substituents for the carbocyclic and heterocyclic groups are selected from the group $R^{10}$ as defined in any one of the preceding claims.

35. A compound according to any one of claims 1 to 23 wherein one of $R^3$ and $R^4$ is a group $C(O)NR^{12}R^{13}$ wherein $R^{12}$ and $R^{13}$ and the nitrogen atom to which they are attached together form a saturated heterocyclic group having from 4 to 7 ring members and containing 1, 2 or 3 heteroatom ring members selected from N, O and S.

36. A compound according to claim 35 wherein the saturated heterocyclic group is selected from morpholino, piperidine, piperazino, N-$C_{1-4}$ alkyl substituted piperazino and pyrrolidino, and preferably is morpholino.

37. A compound according to any one of claims 1 to 23 wherein $R^3$ and $R^4$ are the same or different and are selected from $C_{1-4}$alkyl groups optionally substituted by halogen, hydroxy or methoxy, preferably a halogen such as fluorine.

38. A compound according to any one of the preceding claims wherein the imidazole group




is selected from the groups B1 to B40 (e.g. B1 to B16) set out in Table 2 herein.

39. A compound according to claim 38 wherein the imidazole group is selected from the groups B1 to B6, B8, B9 and B11 to B16 of Table 2, or is selected

from B18, B19, B20, B22, B24, B25, B26, B27, B28, B29, B31, B34, B35, B37 and B38.

40. A compound according to claim 39 wherein the imidazole group is selected from the groups B1 to B6, B8, B9, B11 to B13, B15 and B16.

41. A compound according to claim 40 wherein the imidazole group is selected from the groups B2, B4, B12, B15 and B16.

42. A compound according to any one of the preceding claims in the form of a salt or solvate.

43. A compound of the formula (I) as defined in any one of claims 1 to 42 for use in the prophylaxis or treatment of a disease state or condition mediated by a cyclin dependent kinase.

44. The use of a compound of the formula (I) as in any one of claims 1 to 42 for the manufacture of a medicament for the prophylaxis or treatment of a disease state or condition mediated by a cyclin dependent kinase.

45. A method for the prophylaxis or treatment of a disease state or condition mediated by a cyclin dependent kinase, which method comprises administering to a subject in need thereof a compound of the formula (I) as defined in any one of claims 1 to 42.

46. A method of inhibiting a cyclin dependent kinase, which method comprises contacting the kinase with a kinase-inhibiting compound of the formula (I) as defined in any one of claims 1 to 42.

47. A method of modulating a cellular process (for example cell division) by inhibiting the activity of a cyclin dependent kinase using a compound of the formula (I) as defined in any one of claims 1 to 42.

48. A method for treating a disease or condition comprising or arising from abnormal cell growth in a mammal, which method comprises administering

to the mammal a compound of formula (I) as defined in any one of claims 1 to 42 in an amount effective in inhibiting abnormal cell growth.

49. A method for treating a disease or condition comprising or arising from abnormal cell growth in a mammal, the method comprising administering to the mammal a compound of formula (I) as defined in any one of claims 1 to 42 in an amount effective to inhibit cdk activity (e.g. cdk1 or cdk 2).

50. A compound of the formula (I) as defined in any one of claims 1 to 42 for use in the prophylaxis or treatment of a disease state or condition mediated by glycogen synthase kinase-3.

51. The use of a compound of the formula (I) as in any one of claims 1 to 42 for the manufacture of a medicament for the prophylaxis or treatment of a disease state or condition mediated by glycogen synthase kinase-3.

52. A method for the prophylaxis or treatment of a disease state or condition mediated by glycogen synthase kinase-3, which method comprises administering to a subject in need thereof a compound of the formula (I) as defined in any one of claims 1 to 42.

53. A method of inhibiting glycogen synthase kinase-3, which method comprises contacting the kinase with a kinase-inhibiting compound of the formula (I) as defined in any one of claims 1 to 42.

54. A method of modulating a cellular process (for example cell division) by inhibiting the activity of glycogen synthase kinase-3 using a compound of the formula (I) as defined in any one of claims 1 to 42.

55. A method for treating a disease or condition comprising or arising from abnormal cell growth in a mammal, the method comprising administering to the mammal a compound of formula (I) as defined in any one of claims 1 to 42 in an amount effective to inhibit glycogen synthase kinase-3 activity.

56. A compound for use, a use, or a method as defined in any one of claims 38 to 50 wherein the disease state or condition is selected from proliferative disorders such as cancers and conditions such as viral infections, autoimmune diseases and neurodegenerative diseases.

57. A compound for use, a use or a method according to claim 51 wherein the disease state is a cancer selected from breast cancer, ovarian cancer, colon cancer, prostate cancer, oesophageal cancer, squamous cancer, and non-small cell lung carcinomas.

58. A pharmaceutical composition comprising a compound of the formula (I) as defined in any one of claims 1 to 42 and a pharmaceutically acceptable carrier.

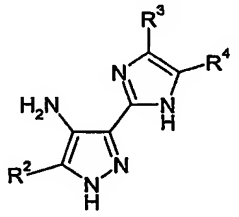
59. A compound of the formula (I) as defined in any one of claims 1 to 42 for use in medicine.

60. The use of a compound as defined in any one of claims 1 to 42 for the manufacture of a medicament for the treatment or prophylaxis of a fungal infection in an animal.

61. A method for the treatment or prophylaxis of a fungal infection in an animal or plant comprising administering to the animal or plant an effective antifungal amount of a compound of the formula (I) as defined in any one of claims 1 to 42.

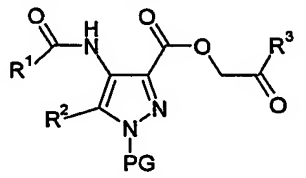
62. A process for the preparation of a compound of the formula (I) as defined in any one of claims 1 to 42; which process comprises:

(i) the reaction of a compound of the formula (XXX):



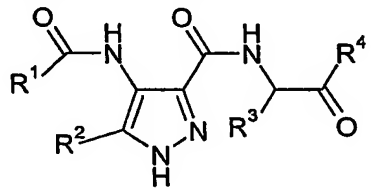
or a protected form thereof, with a compound of the formula $R^1$-A' wherein A' is a reactive entity capable of reacting with the amino group of the compound (XXX) to form the moiety $R^1$-A-NH- in the compound of the formula (I), and thereafter removing any protecting group present;

(ii) the reaction of a compound of the formula (XVII):



wherein PG is a protecting group, with ammonia or an ammonium salt at a temperature in excess of 100 °C (preferably in excess of 150 °C), and thereafter removing the protecting group:

(iii) the reaction of a compound of the formula (XXXIIIa):



or a protected form thereof, with ammonia or an ammonium salt in the presence of an acid, and thereafter removing any protecting group present.

63. A process according to claim 56 (i) wherein the compound of the formula $R^1$-A' is a carboxylic acid $R^1$-$CO_2H$ or a reactive derivative thereof, or an isocyanate $R^1$-N=C=O, or a reactive formate ester of the formula $R^1$-OC(=O)-L' wherein L' is a leaving group or atom such as a halogen.